

SMALL DEPRESSION POND (CUTGRASS PRAIRIE SUBTYPE)

Concept: Small Depression Ponds are the communities in mainland Coastal Plain small depressions, with permanent flooding or with hydroperiods lasting most of the growing season. The Cutgrass Prairie Subtype encompasses examples typically in small, flat Carolina bays or other depressions with loamy soils and a hydroperiod slightly shorter than other marsh subtypes, in which the vegetation is dominated by or has a substantial component of *Leersia hexandra*.

Distinguishing Features: The Small Depression Pond type is distinguished from Small Depression Drawdown Meadow by vegetation and soils characteristic of deeper and more permanent standing water, with a hydroperiod lasting most, if not all, of the growing season. They tend to have soils with at least some muck accumulation. The Cutgrass Prairie Subtype is distinguished by the dominance or codominance of *Leersia hexandra* during wet periods and a continued substantial presence of it during droughts.

Synonyms: *Leersia hexandra* - (*Panicum verrucosum*, *Scleria reticularis*) Herbaceous Vegetation [Provisional] (CEGL004047).

Ecological Systems: Southern Atlantic Coastal Plain Depression Pondshore (CES203.262).

Sites: The Cutgrass Prairie Subtype occurs primarily in clay-based Carolina bays but may occur in other kinds of depressions.

Soils: Soils are believed to be mineral soils with a thin layer of muck. Most of the few examples are mapped in soil surveys as water.

Hydrology: Surface water is shallow to deep, usually 1 to several feet deep. Standing water is present for most or all of the growing season in normal years. When it is not present, the soil remains saturated. Studies of *Leersia*-dominated vegetation in South Carolina suggest that this community has deeper water and more variable water levels than other marshes (Kirkman and Sharitz 1994, Mulhouse, et al. 2005).

Vegetation: The Cutgrass Prairie Subtype is largely treeless, though *Pinus taeda* and hardwoods may invade them during prolonged drought. The herbaceous vegetation is dense. *Leersia hexandra* dominates in times of typical water levels, often in nearly pure stands. *Kellochloa* (*Panicum*) *verrucosa* may be abundant, even codominant, right after drawdown. *Hymenachne hemitomon* may become abundant in longer droughts. Other herbs sometimes, generally at low frequency, include *Scleria reticularis*, *Eleocharis robbinsii*, *Eleocharis melanocarpa*, *Dichanthelium wrightianum*, *Rhynchospora filifolia*, *Lachnanthes caroliniana*, *Rhexia aristosa*, and *Nymphoides cordata*.

Range and Abundance: Ranked G2G3. Only a few well-developed examples are known in North Carolina but more may be overlooked. The synonymized NVC association is only attributed to North Carolina. It might be expected in South Carolina, but Nifong's (1998) extensive study of Carolina bays did not identify any there.

Associations and Patterns: The Cutgrass Prairie Subtype may fill most or all of a basin or may occur as a zone in bays with other communities. Sites are naturally surrounded by longleaf pine communities but it now more often occurs in heavily altered landscapes.

Variation: No enduring patterns of variation have been identified. Examples may vary drastically in response to changing water levels. Nifong (1998) classified three associations, which he indicated were short-term successional stages.

Dynamics: Dynamics in general are similar to other herb-dominated depression communities, with vegetation potentially varying dramatically in response to weather patterns. Kirkman and Sharitz (1993) demonstrated some of the biological characteristics of *Leersia hexandra*, showing that it has the ability for stem elongation when flooded and that it elongated more than the other species studied. This presumably makes it able to withstand deeper flooding than *Hymenachne hemitomon*, but how this compares to the other sometimes-dominant marsh species is not known. It grows and reproduces best in flooded conditions. At the same time, it had less stomatal control, making it more prone to drought. Mulhouse, et al. (2005) showed that areas dominated by *Leersia* in South Carolina showed more vegetation change during severe drought than did areas dominated by *Hymenachne* or *Carex striata*; they attributed this to less competitive standing vegetation, but noted *Leersia* marshes also had deeper water and more substantial seasonal water level fluctuations.

Nifong (1998) recognized three *Leersia* associations: *Leersia* Prairie (2.0.1), *Leersia/Panicum verrucosum* Prairie (2.0.2), *Pinus taeda/Panicum hemitomon/Leersia* “successional prairie” (2.0.3). He emphasized the successional relationships among the three, suggesting that they are different phases that can occur in the same site at different times in normal climatic cycles.

As in other herbaceous wetlands, fire may be important for keeping uncharacteristic woody vegetation from establishing during drought, but known examples appear to be less subject to tree invasion than Cypress Savanna.

Comments: The Cutgrass Prairie Subtype is one of the least well understood of North Carolina’s communities. Only a few examples are known in site reports or in the Nifong (1998) plots. *Leersia hexandra* may be present in patches in other depression communities, making it difficult to recognize well-developed examples of this community.

Nifong (1998) called this community intermittently flooded depression prairie. He suggested that it was intermediate between marshes and wet meadows. It appears wetter than Cypress Savanna. It may perhaps bear the same relationship to Cypress Savanna that the Typic Marsh Subtype does to Small Depression Drawdown Meadow (Typic Subtype). It is unclear if it is analogous to any of the communities called prairies farther south.

Rare species: Vascular plants: *Agalinis virgata*, *Drosera filiformis*, *Eleocharis robbinsii*, *Iva microcephala*, *Rhexia aristosa*, *Ludwigia suffruticosa*, *Paspalum dissectum*, *Rhynchospora microcarpa*, *Rhynchospora tracyi*, *Sagittaria isoetiformis*, and *Scleria reticularis*.

Vertebrate Animals: *Ambystoma maybei*, *Ambystoma tigrinum*, *Anaxyrus quercicus*, *Dierochelys reticularia reticularia*, *Pseudacris nigrita*, *Pseudacris ornate*, and *Rana capito*.

References:

- Kirkman, L.K. and R.R. Sharitz. 1993. Growth in controlled water regimes of three grasses common in freshwater wetlands of the southeastern USA. *Aquatic Botany* 44: 345-359.
- Mulhouse, J.M., D. De Steven, R.F. Lide, and R.R. Sharitz. 2005. Effects of dominant species on vegetation change in Carolina bay wetlands following a multi-year drought. *Journal of the Torrey Botanical Society* 132: 411-420.
- Nifong, T.D. 1998. An ecosystematic analysis of Carolina bays in the Coastal Plain of North Carolina. Ph.D. Dissertation, University of North Carolina, Chapel Hill.